"YOU HAVE TO SPEND SOME ENERGY AND EFFORT TO SEE THE BEAUTY OF MATH." —MARYAM MIRZAKHANI

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MATHEMATICIAN

Maryam Mirzakhani, born in 1977 in Iran, grew up reading every book she could find. She wanted to become a writer and didn't have much of an interest in math until high school, when she got her hands on the entrance questionnaire for an international math competition. Maryam struggled to solve the problems and spent days on a worksheet that should have taken her hours. Excited by this new challenge, she demanded that her all-girl high school provide the same math courses as the boys' schools did.

Maryam came to America for graduate school at Harvard. She became interested in understanding the surface of a shape and what happens when it is distorted. She enjoyed finding the beauty in mathematics and focused on hyperbolic surfaces.

Hyperbolic doughnuts are abstract shapes; to understand them, you need to find straight lines, or "simple" geodesics, inside. This is incredibly difficult. Maryam created an equation that showed the relationship between the amount of simple geodesics and the length of the side of a hyperbolic structure. Her work is fundamental in understanding curved shapes and surfaces.

There was another unsolved problem in mathematics: a billiard ball is bouncing around, hitting the sides of a table forever in a frictionless environment. Will a ball that is hit from any direction always end up where it started? What about the infinite possible shapes of the billiard table? This problem was so complicated, computers couldn't even simulate it!

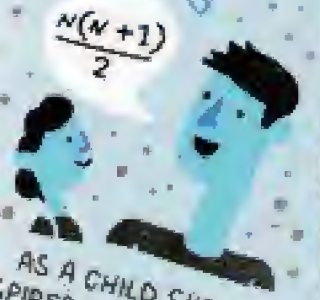
Maryam thought of a different way to solve this problem. Instead of moving the ball around the table, she mirrored the table around the ball. When the ball hit a side, the table would flip and change angles, so it would look as if the ball stayed in a straight line. She figured out that the ball will always close its loop. This has been compared to how particles might behave and has given us a better understanding of geometry, physics, and quantum theory.

In 2014, Maryam won the Fields Medal for her work, the first woman so honored. Maryam works at Stanford, where she continues to push boundaries in mathematics.

THE FIELDS MEDAL IS CONSIDERED THE NOBEL PRIZE IN MATH.

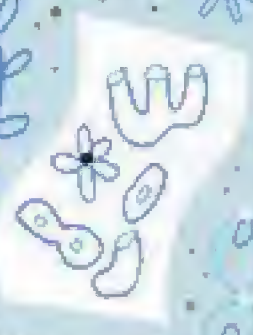
HAS DONE IMPORTANT WORK ON TEICHMÜLLER DYNAMICS AND MODULI SPACE.

MARYAM AND HER FRIEND BECAME THE FIRST GIRLS ON IRAN'S INTERNATIONAL MATHEMATICAL OLYMPIAD TEAM AND SHE WON A GOLD MEDAL.



AS A CHILD SHE WAS INSPIRED WHEN HER OLDER BROTHER TOLD HER ABOUT THE MATH PROBLEM OF ADDING ALL THE NUMBERS BETWEEN 1 AND 100.

CREATED A NEW PROOF OF EDWARD WITTEN'S THEORY ABOUT TOPOLOGICAL MEASUREMENTS OF MODULI SPACES.



SHE DRAWS HYPERBOLIC SHAPES ON HUGE PIECES OF PAPER TO BETTER UNDERSTAND THEM.